Scilab Assignment 1

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B.Sc. Physics (H) II year

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**Section 1 : Scilab as Calculator**

**Question 1**

**Code:**

*// Bajrang 363*

*// S1Q1 Define the variables a = 15.62, b = -7.08, c = 62.5 and d = 0.5(ab-c)*

*// Evalute the following*

*// (a) a+ (a\*b(a+d)^2)/ c\*sqrt(abs(a\*b))*

*// (b) d\*exp(d/2) + ((a\*d+c\*d)/(20/a+30/b))/a+b+c+d*

a = 15.62;

b = -7.08;

c = 62.5;

d = 0.5\*(a\*b-c)

sol1 = a + (a\*b\*((a+d)^2))/(c\*sqrt(abs(a\*b)));

disp("a+ (a\*b\*(a+d)^2)/ c\*sqrt(abs(a\*b)) = ", sol1)

sol2 = d \* exp(d/2) + ((a\*d + c\*d)/(20/a+20/b))/(a+b+c+d);

disp("d\*exp(d/2) + ((a\*d+c\*d)/(20/a+30/b))/a+b+c+d = ", sol2)

**Output:**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s1q1.sce', -1)

"a+ (a\*b\*(a+d)^2)/ c\*sqrt(abs(a\*b)) = "

-830.77554

"d\*exp(d/2) + ((a\*d+c\*d)/(20/a+30/b))/a+b+c+d = "

-282.33418

**Question 2**

**Code:**

*// Bajrang 363*

*// S1Q2 Calculate*

*// (cos(5\*%pi/6))^2\*(sin(7\*%pi/8)\*\*2)+ (tan(((%pi)/6)\*log(8))/sqrt(7)*

*// (3\*\*7\*log(76))/7\*\*3+546 + (910)\*\*(1/3)*

sol1 = (cos(5\*%pi/6))^2\*(sin((7\*%pi/8)\*\*2)) + (tan(((%pi)/6)\*log(8))/sqrt(7))

disp(“cos(5\*%pi/6))^2\*(sin((7\*%pi/8)\*\*2)) + (tan(((%pi)/6)\*log(8))/sqrt(7) = ”, sol1)

sol2 = ((3^7)\*log10(76))/(7^3+546) + (910)^(1/3)

disp(“((3^7)\*log10(76))/(7^3+546) + (910)^(1/3) = ”, sol2)

**Output:**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s1q2.sce', -1)

“cos(5\*%pi/6))^2\*(sin((7\*%pi/8)\*\*2)) + (tan(((%pi)/6)\*log(8))/sqrt(7) = “

1.4395045

“((3^7)\*log10(76))/(7^3+546) + (910)^(1/3) = “

14.317449

**Question 3**

**Code**

*// Bajrang 363*

*// Section 1 Question 3*

v = 350;

r = ((3\*v)/(4\*%pi))^(1/3);

disp("Radius is = ", r)

s = 4\*%pi\*(r^2);

disp("Surface Area is = ", s)

**Output**

-> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s1q3.sce', -1)

"Radius is = "

4.3717952

"Surface Area is = "

240.17593

**Section 2**

**Question 1-5**

**Code**

*// Bajrang 363*

*// Section 2*

*// Creating and Handling Arrays*

*// Creating row vector A*

A = [32, 4, 81, exp(2.5), 63, cos(%pi/3), 14.12];

disp("Row vector A is ", A)

*// Sum of all elements in A*

S = sum(A)

disp("Sum of all elements of A is ", S)

*// Row vector with the first element is 1 and last element is 33 with increment of 2*

r = [1:2:33]

disp("Row vector with the first element is 1 and last element is 33 with increment of 2 ", r)

*// Row vector with 15 equally spaced elements b/w 7 and 40*

er = [linspace(7,40,15)]

disp("Row vector with 15 equally spaced elements b/w 7 and 40", er)

*// Row vector with 12 equally spaced elements b/w -1 and -15*

p = [linspace(-1,-15,12)]

disp("Row vector with 12 equally spaced elements b/w -1 and -15 ", p)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2.sce', -1)

"Row vector A is "

32. 4. 81. 12.182494 63. 0.5 14.12

"Sum of all elements of A is "

206.80249

"Row vector with the first element is 1 and last element is 33 with increment of 2 "

column 1 to 16

1. 3. 5. 7. 9. 11. 13. 15. 17. 19. 21. 23. 25. 27. 29. 31.

column 17

33.

"Row vector with 15 equally spaced elements b/w 7 and 40"

column 1 to 8

7. 9.3571429 11.714286 14.071429 16.428571 18.785714 21.142857 23.5

column 9 to 15

25.857143 28.214286 30.571429 32.928571 35.285714 37.642857 40.

"Row vector with 12 equally spaced elements b/w -1 and -15 "

column 1 to 8

-1. -2.2727273 -3.5454545 -4.8181818 -6.0909091 -7.3636364 -8.6363636 -9.9090909

column 9 to 12

-11.181818 -12.454545 -13.727273 -15.

**Question 6**

**Code**

*// Bajrang 363*

*// Section 2 Question 6*

*// part(a)*

A = zeros(2,5)

disp("A = ", A)

*// part(b)*

B = eye(4,4)

disp("B = ", B)

*// part(c)*

C = ones(3,2)

disp("C = ", C)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2q6.sce', -1)

"A = "

0. 0. 0. 0. 0.

0. 0. 0. 0. 0.

"B = "

1. 0. 0. 0.

0. 1. 0. 0.

0. 0. 1. 0.

0. 0. 0. 1.

"C = "

1. 1.

1. 1.

1. 1.

**Question 7**

**Code**

*// Bajrang 363*

*// Section 2 Question 7*

A = [6, 43, 2, 11, 87; 12, 6, 34, 0, 5; 34, 18, 7, 41, 9];

disp("A = ", A)

*// part A*

va = A(2,:)

disp("va = ", va)

*// part B*

vb = A(:,4)

disp("vb = ", vb)

*// part C*

vc = [A(1,:),A(2,:)]

disp("vc = ", vc)

*// part D*

vd = [A(:,2)',A(:,5)']

disp("vd = ", vd)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2q7.sce', -1)

"A = "

6. 43. 2. 11. 87.

12. 6. 34. 0. 5.

34. 18. 7. 41. 9.

"va = "

12. 6. 34. 0. 5.

"vb = "

11.

0.

41.

"vc = "

6. 43. 2. 11. 87. 12. 6. 34. 0. 5.

"vd = "

43. 6. 18. 87. 5. 9.

**Question 8**

**Code**

*// Bajrang 363*

*// Section 2 Question 8*

A = [1,2,3,4,5,6,7; 2,4,6,8,10,12,14; 21,18,15,12,9,6,3; 5,10,15,20,25,30,35];

disp("A = ", A)

*// Part A*

B = [A(1,1), A(1,3), A(1,5), A(1,7); A(3,1), A(3,3), A(3,5), A(3,7); A(4,1), A(4,3), A(4,5), A(4,7)]

disp("B = ", B)

*// part B*

u = [A(3,:), A(:,5)', A(:,7)']

disp("u = ", u)

*// part C*

D = diag(A)

disp("D = " , D)

disp("Sum of diagonal elements = ", sum(D))

*// Part D*

S = size(A)

disp("S = ", S)

*// Part E*

A1 = matrix(A, [2,14])

disp("A1 = ", A1)

A2 = matrix(A, [14,2])

disp("A2 = ", A2)

P = A1\*A2;

disp("A1\*A2 = P = ", P)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2q8.sce', -1)

"A = "

1. 2. 3. 4. 5. 6. 7.

2. 4. 6. 8. 10. 12. 14.

21. 18. 15. 12. 9. 6. 3.

5. 10. 15. 20. 25. 30. 35.

"B = "

1. 3. 5. 7.

21. 15. 9. 3.

5. 15. 25. 35.

"u = "

21. 18. 15. 12. 9. 6. 3. 5. 10. 9. 25. 7. 14. 3. 35.

"D = "

1.

4.

15.

20.

"Sum of diagonal elements = "

40.

"S = "

4. 7.

"A1 = "

1. 21. 2. 18. 3. 15. 4. 12. 5. 9. 6. 6. 7. 3.

2. 5. 4. 10. 6. 15. 8. 20. 10. 25. 12. 30. 14. 35.

"A2 = "

1. 12.

2. 20.

21. 5.

5. 10.

2. 9.

4. 25.

18. 6.

10. 12.

3. 6.

6. 30.

15. 7.

15. 14.

4. 3.

8. 35.

"A1\*A2 = P = "

734. 1744.

1708. 3542.

**Question 9**

**Code**

*// Bajrang 363*

*// Question 9*

V = [zeros(2,5); ones(2,5)]

disp("V = ", V)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2q9.sce', -1)

"V = "

0. 0. 0. 0. 0.

0. 0. 0. 0. 0.

1. 1. 1. 1. 1.

1. 1. 1. 1. 1.

**Question 10**

Code

*// Bajrang 363*

*// Section 2 Question 10*

for i=1:6

for j = 1:6

U(i,j) = 0;

if (i==3|i==4|j==3|j==4)

U(i,j) = 1;

end

end

end

disp("U = ", U)

**Output**

--> exec('C:\Users\kaila\OneDrive\Desktop\Bahubali\Assignment\s2q10.sce', -1)

"U = "

0. 0. 1. 1. 0. 0.

0. 0. 1. 1. 0. 0.

1. 1. 1. 1. 1. 1.

1. 1. 1. 1. 1. 1.

0. 0. 1. 1. 0. 0.

0. 0. 1. 1. 0. 0.

Thank You